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Logistic regression approach for the determinants of acute poverty at household level in Tanzania

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Abstract
The main aim of this article is to establish poverty determinants i.e. the factors that increase the risk of poverty as well as to estimate the extent to which households are threatened by this phenomenon and to estimate and compare poverty spheres in a regional approach by means of the most important poverty indicators by using socioeconomic aspects of poverty with reference to Tanzania. This study used national panel survey data of 2014/15 of Tanzania to find the determinants of poverty. The households, who scored more than 33% of the deprivation score were categorized to be under acute poverty line. The socio-economic and demographic characteristics of the household head and household's characteristics in general, were used as the predictor variables to associate them with the household poverty status which were either poor or non-poor. The logistic regression technique has been used to determine the likelihood of the household poverty as affected by socio-economic and demographic factors. The study found that the education level, marital status and employment status of the household' head were significantly associated with poverty.

Keywords: objective poverty, poverty indicator, relative risk, logit model, chance quotient

1. Introduction
Poverty is defined as shortage of income or of access to the range of resources that usually provide the basic necessities of life for humans, such as food, shelter, sanitation, clean water, medical care, and education (Oxford, 2018) [12]. The 30 years development vision of 1995, planned with the ambition of Tanzania Development Vision 2025, foresees high-quality livelihoods and eradication of extreme poverty as the main goals along with the objectives of furthering peace, stability and national unity. Tanzania is ranked number 151 out of the 188 countries based on Humana Development Index (HDI) (UNDP, 2015) [16]. This means current implication of multi-dimensional poverty indicators from the dimensions of health, education and living standard in Tanzania is still under multiple deprivations (Kilama *et al.* 2016) [10]. Therefore, there is a need to investigate the determinants of acute poverty at household level in Tanzania in order to provide vital information for targeting interventions to reduce if not to eliminate the acute poverty in Tanzania. The findings from this study will provide information to the policy and decision makers on factors influencing acute poverty as well as the social protection.

2. Literature review
With the increasing understanding that poverty is of multidimensional and dynamic nature, many studies had responded with new measures and tools that comprehensively measure poverty to the strong demands of governments and international communities (Anand and Sen 1997; Bourguignon and Chakravarty 2003; Maasoumi and Lugo 2008; Alkire and Foster 2011; Guedes *et al.* 2012) [6, 7, 5, 9] and Awel, 2013. For examples, poverty was measured by use of Human Development Index (UNDP 1997) [15], and also by Multidimensional Poverty Index (*MPI*) proposed by Alkire and Foster (2010) [4], stressing that human poverty has been caused by inequalities of their achieved rights and abilities, such as education, health, job, policy and so on. There are number of empirical studies also conducted on the determinants of poverty at households' level based on the monetary measure on multidimensional deprivation. Busisa (2011) [8] discussed how the socio-economic and demographic characteristics of households

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are affecting the poverty status of the households by using the multinomial regression whereby the dependent variable was categorized into three outcomes of poverty status of household viz. poor, middle class and rich. The household possession score was found to be associated with place of residence, household head sex, occupation, marital status, education and the age of the household head. Households in urban areas were found to be richer than those in rural areas. Akerele *et al.* (2012) [1] found that 41.0 percent of the households covered by the study were poor and would have to mobilize financial resources up to 45.0 percent of 1 US Dollar per day (for each household member) to be able to escape poverty. The incidence of poverty was higher among female-headed households with values 0.26 and 0.43, respectively. The same pattern was also found among households with larger number of dependents' with values ranging from 0.74 to 1.00 for incidence of poverty and from 0.70 to 0.77 for depth of poverty. Dependency ratio, household assets and educational status of household head, among others, were socio-economic factors influencing the poverty. It was concluded that household multidimensional poverty is associated with the proportion of children in a household but not with household size. However, the results indicated that, monetary assets are not necessarily needed for improving one's poverty status, but infrastructure, diverse livelihood activities and multidimensional poverty could be related regardless of changes in monetary consumption. Sekhampu (2012) [14] used binary logistic regression to analyze the poverty status of household based on poverty line by socio-economic and demographic characteristics of the household. The results showed that household size, the age and employment status of the head of household significantly explain variations in the likelihood of being poor. Household size was positively associated with the probability of being poor, whereas the age and employment status of the head of the household reduces the probability of being in the poor category. It is of interest to note that the educational attainment of the household head is not important in reducing the chances of being a poor household. Alkire & Santos (2014) [3] studied the socio economic determinants of poverty, the poverty measure used cannot be suitable since it is income measure based on poverty line which cannot be reliable to determine social wellbeing of the household since measure of 1US Dollar per day is more indirect measure of acute poverty as compared to Multidimensional Poverty measure.

Maloma (2016) analyzed the poverty line measure in respect to the number of household's as well as household head's characteristics which influences household's poverty status by using binary logistic regression model in analyzing the likelihood of household falling into poor category due to those characteristics. Households in which the adult members are less educated, with lower levels of literacy, often tend to be highly affected by poverty. Pasanen (2017) [13] studied the Multidimensional poverty on two levels of household and village level to examine the factors related to different aspects of poverty by using Malt-structural Equation Modelling (MSEM).

The conceptual framework of this study is presented in Fig-1 which shows the possible causes of the household's multi-dimensional deprivation on the dimension of health, education and living standards at household level which are connected to those characteristics. Finally the multidimensional deprivations may lead to the household's acute poverty condition.
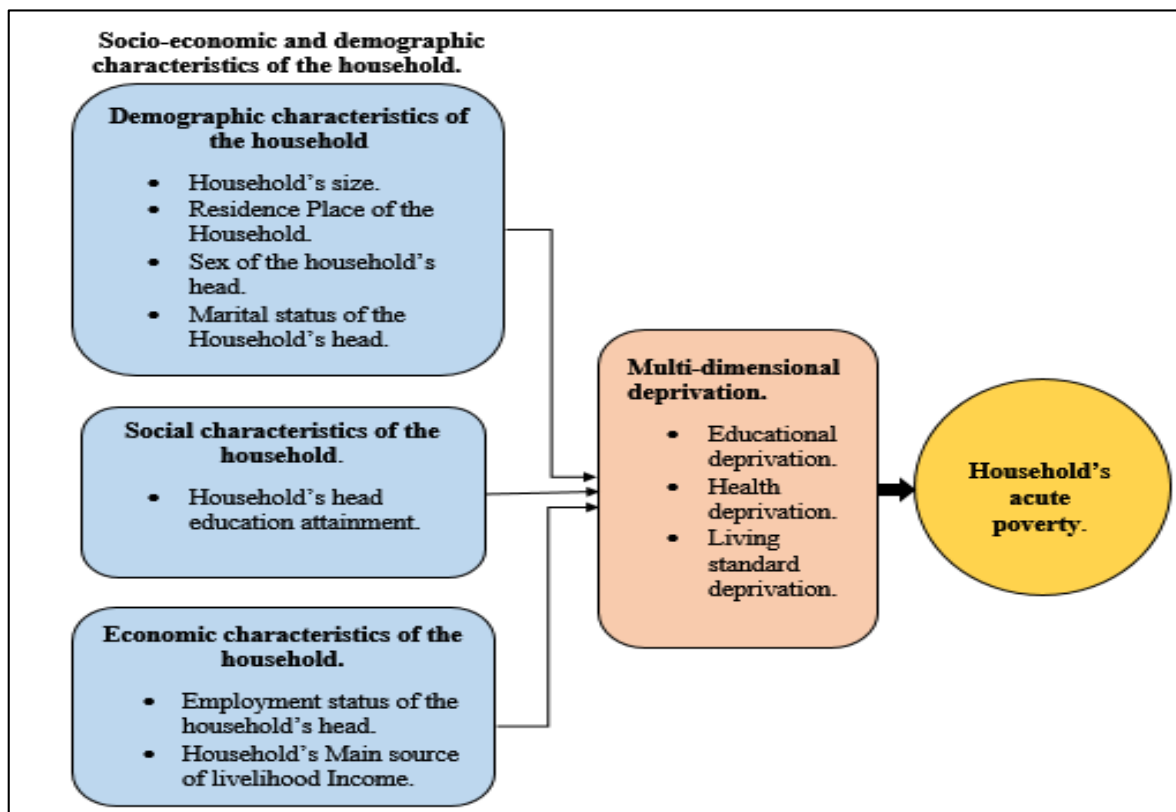

Fig 1: Conceptual framework

3. Research area and data source
The secondary data for this study were collected from the National Bureau of Statistics (NBS) on the National Panel Survey wave number 4 of 2014/15 dataset. The analysis has been done using SPSS-Statistical Package for Social Sciences and R software at two levels. First the households were categorized into poor and non-poor based on the deprivation scores. The second level of analysis was inferential analysis using the binary logistic regression model to assess the determinants of poverty status by socio-economic and demographic characteristics of the household.

Study variables
The independent variables of this study were derived from the socio-economic and demographic characteristics of the household's head as well from the general characteristics of the household. The household head's characteristics are education level attained by the head, marital Status, sex, age and employment status. While the household characteristics were household's place of residence, household's size and household's main source of livelihood income.

Variables categorizations
The dependent and the independent variables were categorized into the number of categories according to the nature of the particular variable. The dependent variable of the study which is household's acute poverty status has been categorized into two level which is 'Poor' and 'Non Poor' households depending on the acute poverty status. The categorization of the dependent variable was based on the multiple deprivation scores which are due to the approach of multidimensional poverty analysis. The multidimensional deprivation is the methodology of poverty measurements based on three dimensions which are health, education and living standards. The global development index known as Multi-dimensional Poverty Index (MPI), is the method of measuring household's acute poverty condition, the total ten indicators which are equally weighted, were derived from these three dimensions. The indicators assessed for the households in order to set acute poverty cut off were such as school attendance, school attainment, under-five child mortality, malnutrition, presence of electricity, source of drinking water, sanitation, type of cooking fuel, flooring material of the house, and assets ownership by the household. The households' deprivation scores were assessed in order to determine if the household's scores for deprivation is below the cutoff point or not.

The indicators from living standard dimension which contributed six indicators out of ten were weighted (0.066 each), and both health and education dimensions were equally contributing each two indicators and four out of ten indicators and each were weighted 0.166. The total deprivation scores can be summed to 1 if the household is deprived in all ten indicators. The households scored the total deprivation more than one-third of the total deprivation which is 0.33 was categorized as the household under acute poverty condition, hence is categorized as 'Poor' while the household scored deprivation score below 0.33 was labeled as 'Non-Poor' as per the definition of acute poverty. "A person(s) is multi-dimensionally poor, if he is deprived in at least one third of the weighted MPI indicators" (Alkire & Robles, 2016) [2]. The independent variables were categorized into levels. Household head's education levels were categorized into five levels which are 'never attended school', 'primary school, 'secondary school', 'diploma' and 'university graduates'. Household head's sex was having two categories of 'male' and 'female. Household head's age was also categorized into three levels which are 'young aged' (below 36 years), 'old aged' (36-59) and 'senior aged' (60+ years).Household head's marital status was categorized into levels such as 'never married', 'married', 'divorced', 'widow(er)' and 'separated'. Household head's employment status was categorized into three levels which are 'unemployed', 'self-employed' and 'employed'. Household's place of residence was categorized as rural and urban. Main source of livelihood income was categorized as 'agriculture' and 'non-agriculture'. Household's size was categorized into three levels which are 'small' (with members less than 5), 'medium' (with 5 members) and 'large' (with more than 5 members).Table 1 gives the variable names, code and their categories.

Table 1: Variables of the study

Variable Name	Code.	Categories
Household's poverty status	HPS	1=Poor, 0=Non Poor
Household head's Education level	HHEDU	1=Never Attended School, 2=Primary School, 3=Secondary School, 4=Diploma, 5=University graduate.
Household head's Sex.	HHSex	1=Male, 2=Female
Household head's Employment status.	HHEMP	1=Unemployed, 2=Self-Employed, 3=Employed
Household head's Age.	HHAGE	1=Young Aged (<36 years), 2=Old Aged (36-60 Years) 3=Senior Aged (60+ Years)
Household's size.	HHsize	1=Small Size (<5 Members), 2=Medium Size (5 Members) 3=Large Size (>5 Members)
Household's Source of livelihood Income	HHSLIV	1=Agriculture, 2=Non-Agriculture
Household's Place of Residence.	HHPR	1=Rural, 2=Urban
Marital Status of the household's head.	HHMS	1=Never married, 2=Married, 3=Divorced, 4=Widow(er), 5=Separated

The dependent variable of the study was poverty status of the household which is dichotomous variable with two outcomes- either poor on non-poor household. Households has been categorized into two categories as poor or non-poor due to the deprivation scores from multidimensional poverty deprivation. Binary logistic regression model is proposed as under:

$$\text{logit}\left(\pi\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_p X_p \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

where $\text{logit}\left(\pi\right) = \log\left(\dfrac{\pi}{1-\pi}\right)$ and π is the probability of an event happening (Household to be poor) and $\beta_0, \beta_1, \ldots, \beta_p$ are regression coefficients; $x_1, x_2, \ldots, x_p$ are predictor variables.From logistic regression model the probability is derived from logit(π) or natural logarithm of odd ratio $\dfrac{\pi}{1-\pi}$. The probability of the an individual predictor variable 'X_p' upon the response

variable 'p' is the expressed as   .The probability of an individual predictor variable is to determine the likelihood of that particular to influence the response variable of the study.

4. Results and discussion

Descriptive analysis: Figure 4.1 presents, the percentage distribution of the Poor and Non-Poor households in Tanzania. The total distribution of households under National Panel Survey 2014/15, shows that about 45% of all households were under acute poverty which is due to multiple deprivations. The remaining proportion about 55% of the total households covered under the survey were found above the acute poverty cutoff.

The distribution of the deprivation across the households' poverty status with the deprivation scores of all ten indicators from three dimensions of education, health and living standards indicators have been presented graphically in figures from 4.2 to 4.12. The results are presented as follows:

In case of source of drinking water, the large proportion (about 86%) of the households, which were under acute poverty, were deprived while only 27.1% of the non-poor households were deprived (Fig-4.2).
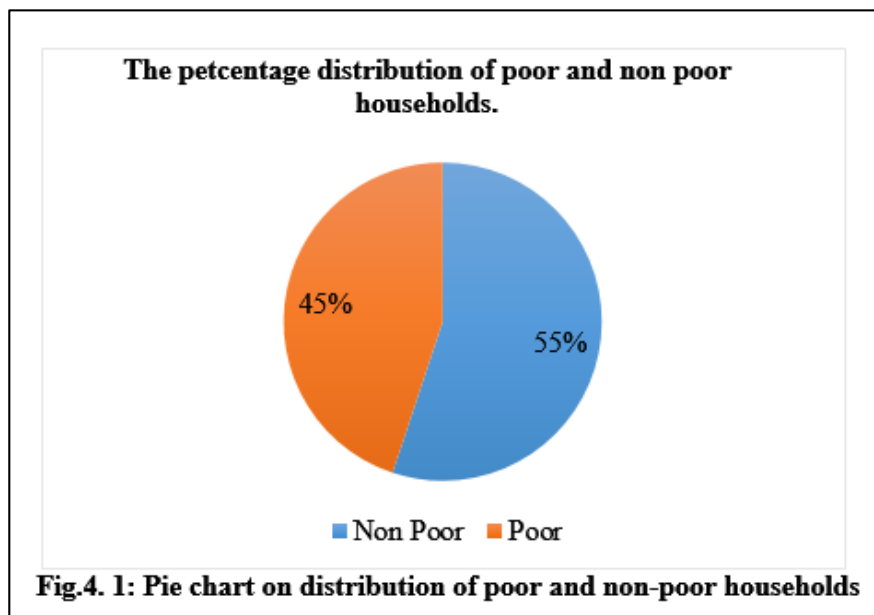
The proportion of the households in acute poverty who rely on either woods, charcoal or animal dung for cooking energy type deprivation, was found to be 100%, while 93% households who did not fall under acute poverty were deprived. This implies that the source of energy for cooking is the crucial indicator in the assessment of acute poverty at household level in Tanzania (Fig-4.3).
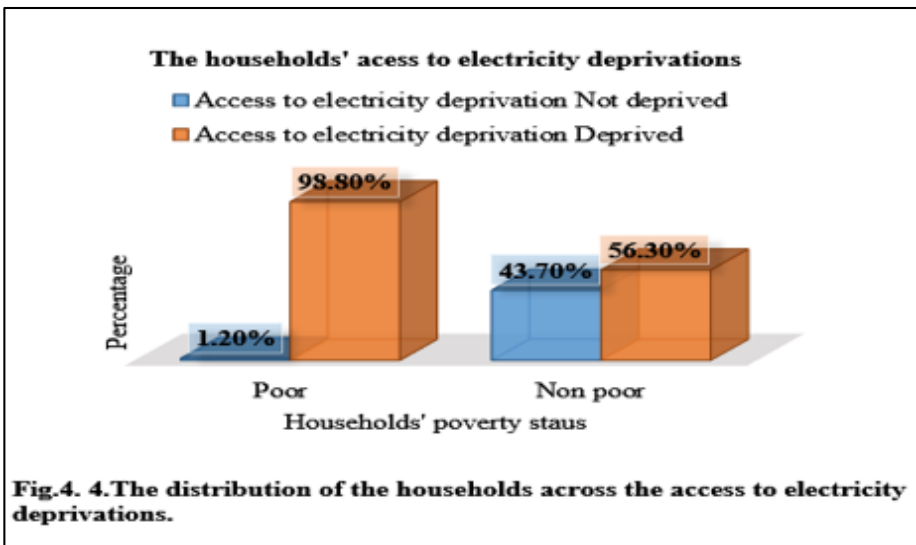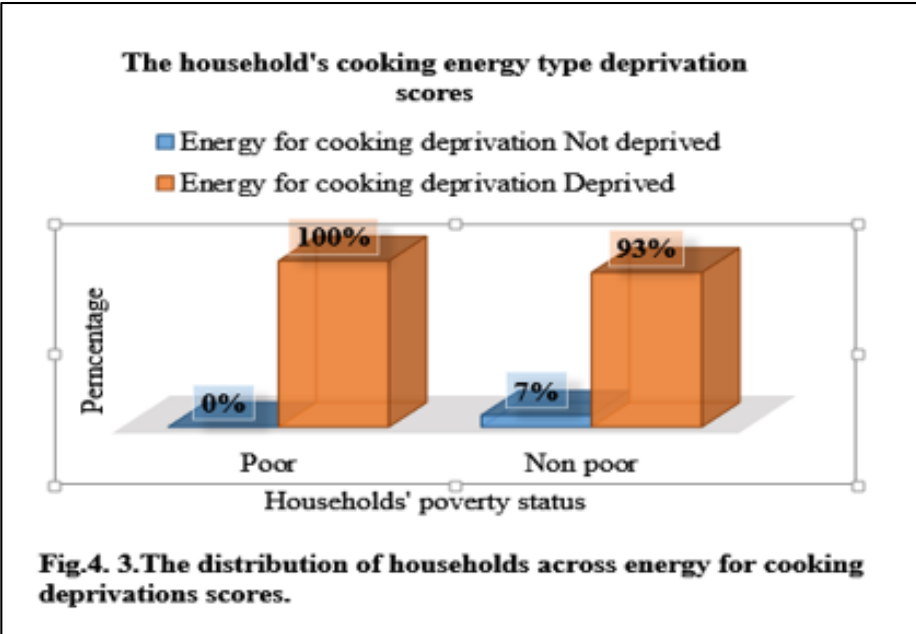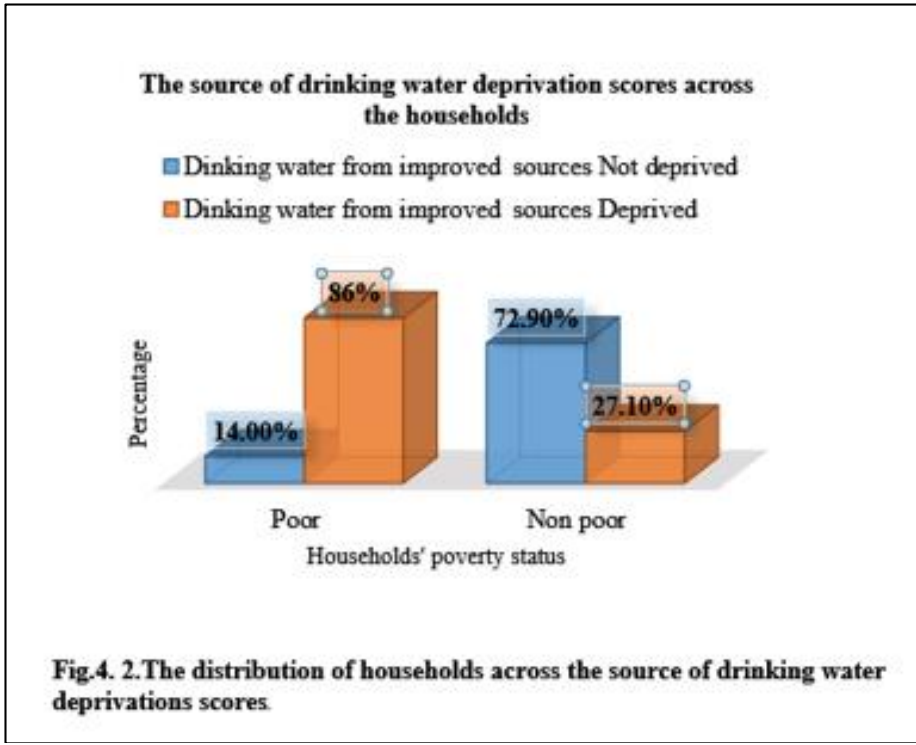
Figure.4.4, presents the distribution of the households across the deprivation scores concerning the availability of electricity. The percentage of poor households without electricity was 98.8%, while for the non-poor households, it was 56.3%. This implies that even those households which are not under acute poverty were still deprived by more than half, in terms of electricity as a proxy indicator to assess the acute poverty condition of the household.

The distribution of households as per the deprivations scores were presented in Figure. 4.5, whereby among those households in acute poverty 97.4% scored deprived, while for those households which were not under acute poverty 41.3% scored deprived. This means larger proportion households were still facing deprivation housing facilities like flooring materials as an indicator for acute poverty. The deprivation scores proportion among the poor households is presented in Figure4.6 which shows that 99.8% of households in acute poverty were deprived in terms of access to improved sanitation facilities, while about 74.2% among the non-poor households were deprived in terms of access to improved sanitation facilities.

The assets ownership of the household was among the indicators of living standards of the households. There is a number of assets which are found to be useful in improving human living standards. There those assets as means of production, transports, communication, storage facilities as well as shelter for the households. There are about ten assets which were radio, television, mobile phone, livestock, field/land, house, motorbike and refrigerator. If the household doesn't own at least five of those assets and does not own tractor or car, then that household is deprived in terms of assets owned. Figure 4.7, shows that about 85% of the poor households were deprived, while 63.9% of the non-poor households were deprived.

The under-five year's children malnourishment indicator used was mid-upper arm circumference (MUAC), was also used to assess the nutritional deprivation at the household level. The household is undernourishment if at least one child is below 12.5 MUAC measure of malnutrition. The deprivation scores distribution is presented in Figure 4.8 which shows that
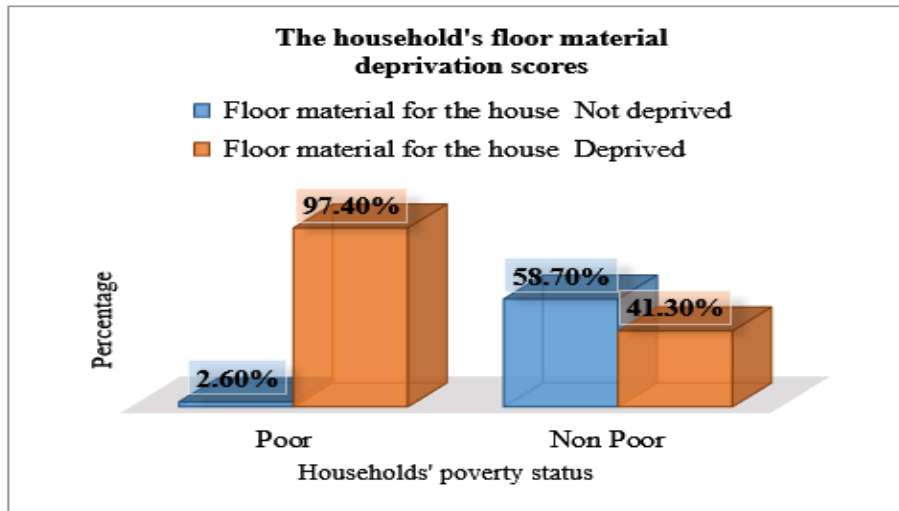

Fig.4. 1: Pie chart on distribution of poor and non-poor households

The source of drinking water deprivation scores across the households

- Dinking water from improved sources Not deprived
- Dinking water from improved sources Deprived

Poor: 14.00%, 86%

Non poor: 72.90%, 27.10%

Households' poverty status

Fig.4. 2.The distribution of households across the source of drinking water deprivations scores.

The household's cooking energy type deprivation scores

- Energy for cooking deprivation Not deprived
- Energy for cooking deprivation Deprived

Poor: 0%, 100%

Non poor: 7%, 93%

Households' poverty status

Fig.4. 3.The distribution of households across energy for cooking deprivations scores.

The households' acess to electricity deprivations

- Access to electricity deprivation Not deprived
- Access to electricity deprivation Deprived

Poor: 1.20%, 98.80%

Non poor: 43.70%, 56.30%

Households' poverty staus

Fig.4. 4.The distribution of the households across the access to electricity deprivations.

Fig.4. 5. The distribution of households across the flooring materials' deprivations.
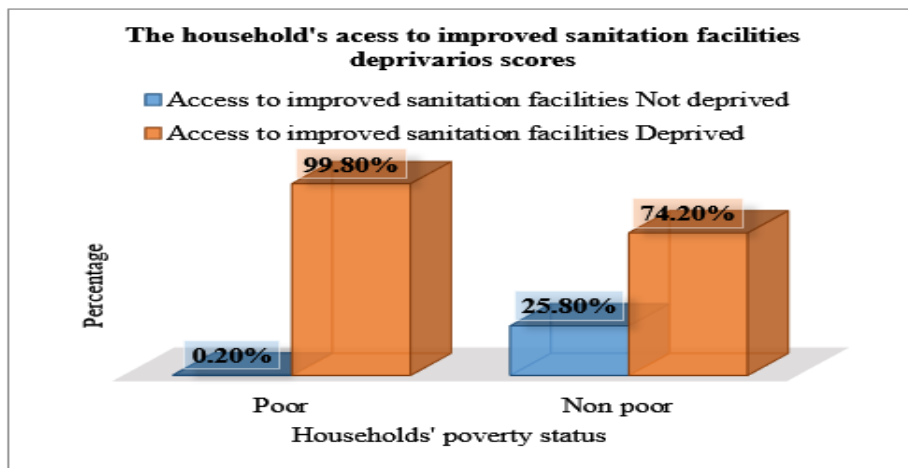

Fig.4. 6.The distribution of households across the access to improved sanitation facilities deprivation scores.
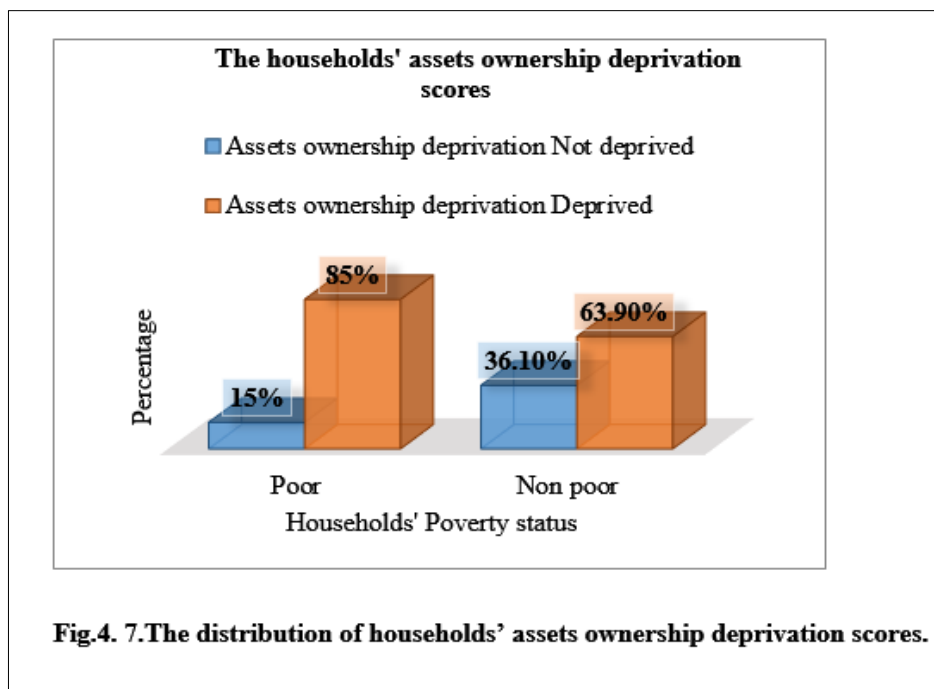

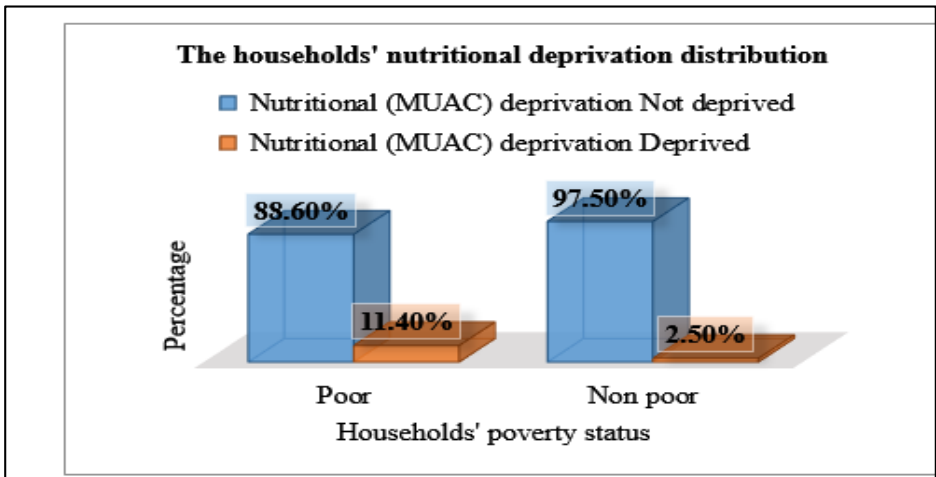**Fig.4. 7.The distribution of households' assets ownership deprivation scores.**

Fig.4. 8.The distribution of households across nutritional indicator deprivation scores
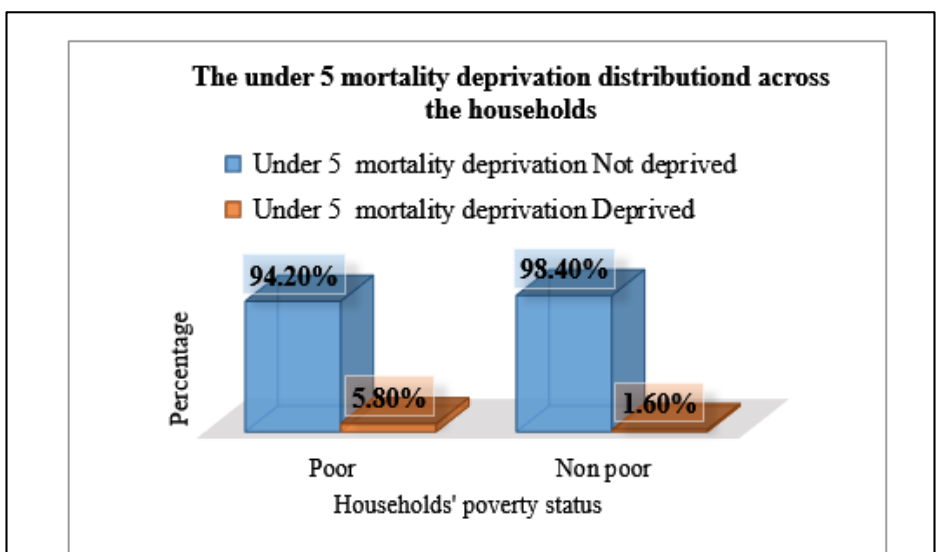

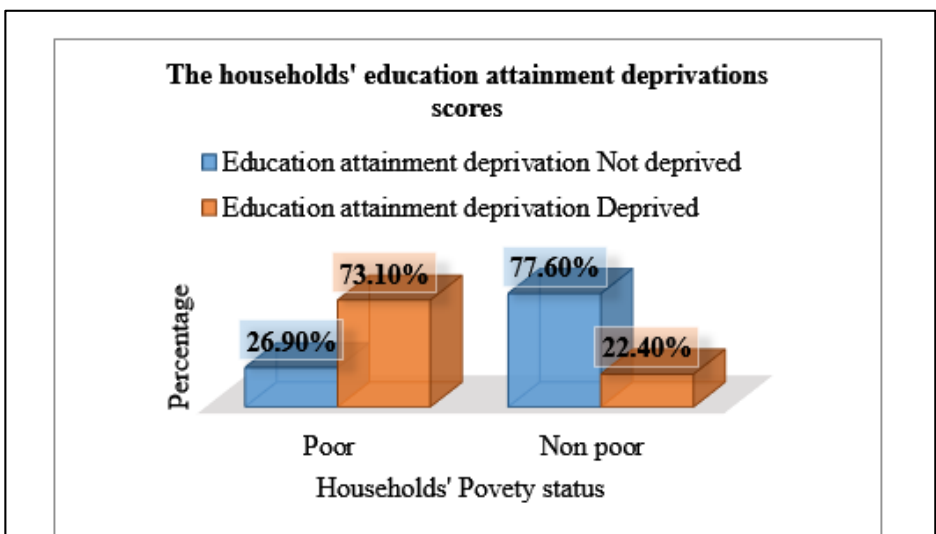**Fig.4. 9.The distribution of households across the under five children mortality deprivations.**

Fig.4. 10.The distribution of households across the education attainment deprivation
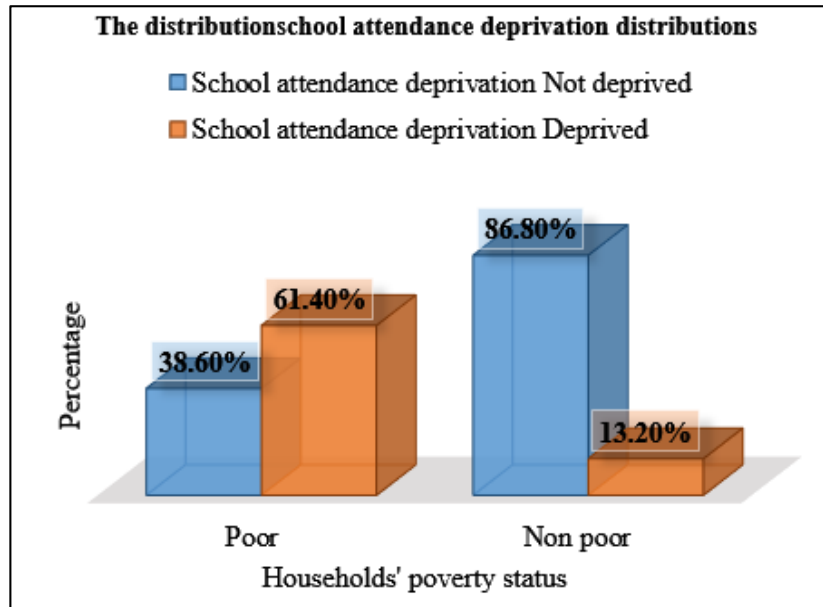
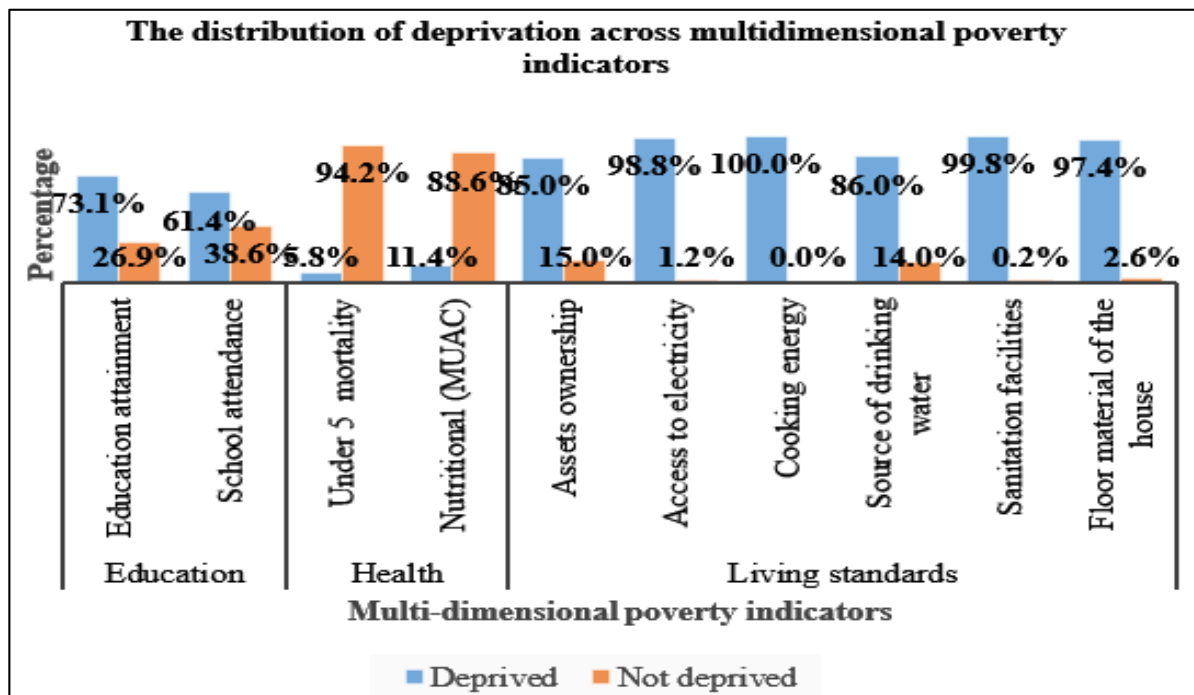**Fig 4.11:** The distribution of households across education attendance

Fig 4.12: The distribution of poor households across multidimensional poverty indicators deprivation scores

11.4% of the poor households were deprived in terms of malnourishment indicator of MUAC, while only 2.5% of the non-poor households were found to be deprived.

Under five child mortality was another proxy indicator used for health deprivation at the household level. The household with the deceased under five year's child was considered to be deprived if has a record of at least one child below age five years deceased. Figure 4.9 presents the facts that 5.8% of the poor households were deprived while only 1.6% of the non-poor households were deprived in terms of under-five child mortality. This indicator is showing good signs concerning health conditions among the households.

The education attainment is considered among the indicators of households' multidimensional poverty measurement. It is the measure which is based on the number of schooling years completed. For the case of Tanzania, the household with at least one member above age 14 years old who failed to complete at least primary school was considered deprived. That means if there is someone above the age of primary education and did not complete primary school education, then that household is deprived in terms of educational attainment. Figure 4.10, presents that among the households under acute poverty 73.1% were deprived, while for non- poor households only 22.4% were deprived in terms of education attainment. Figure.4.11, presents the percentage distribution of the households across their deprivation scores on education school attendance. The proportion of the deprived households among households under acute poverty was 61.4%, while for the non-poor households was only 13.2%. The poor households are facing the serious deprivation from education attendance.

The comparison between three dimensions of education, health and living standards were made to see which dimension is with the largest proportion of the deprivation score by poor households. The overall observation has shown that the largest share of deprivations to poor households was from the indicators of living standards dimensions, then education and health.

Figure 4.12, presents the fact that among households the acute poverty the largest proportion of households were deprived under living standards dimension indicators, the cooking energy indicator has almost 100% proportion of households under acute poverty as deprived, while indicators such as sanitation facilities, about 99.8% of poor households were deprived, the 98.9% of the poor households were deprived in terms of access to electricity indicator, also 97.4% of the poor households were deprived in terms of flooring material for the housing indicator, while about 86% of the poor households were deprived in terms of access of drinking water from an improved source. This implies that the living standards indicators are highly contributed to the households' acute poverty condition in Tanzania.

Logistic regression analysis.
The logistic regression was used to analyze the main determinants of poverty in terms of some qualitative and quantitative variables. In particular, the purpose of the model is to determine the factors that explain the probability of the household being poor. The binary logistic regression model which has been fitted with all variables as per the data that the dependent variable which is household acute poverty status, with two outcomes- Poor or Non-Poor, is fitted into the logistic regression model. The fitted model will be as shown in equation 2.

$$\text{logit}(\pi) = \text{logit}\left(\text{HPS}\{_{\text{Not Poor}=0}^{\text{Poor}=1}\right) = \beta_0 + \beta_1 \text{HHSize} + \beta_2 \text{HHEDU} + \beta_3 \text{HHMS} + \beta_4 \text{HHEMP} + \beta_5 \text{HHPR} + \beta_6 \text{HHSLIV} + \beta_7 \text{HHAGE} + \varepsilon \dots\dots\dots\dots(2)$$

The model fitted has been tested to determine its strengths concerning the accuracy in predicting the outcome variable from each of the corresponding's imputes/predictor variables of the study. The model was run using the R statistical software and hence has got the results of the parameters estimates basing on the maximum likelihood estimation techniques.

Model diagnostic tests.
The Pseudo R^2 test and Receiver Operating Characteristics Curve (ROC-Curve) were used as model diagnostic tests to determine how much the specified model is strong enough to accurately predict the study outcome variable, using the set of the available predictor variables (independent variables). The pseudo R^2 value of the model was found to be 0.19, which showed that the model fits well the data for assessing the predictive strength of the logistic regression model as given in the literature that if the McFadden value approaches to 0.2, the model is strongly predicting the response variable. ROC-Curve is to summarize the model performances by evaluating the trade-offs between the true positive rate (Sensitivity) and false positive rate (1-Specificity). The curve shows the prediction power of the model by considering the area under the curve (AUC), the area under the curve is assumed to be greater than 0.5 for the model to be accurate (AUC>0.5). Therefore in this case the higher the AUC better the prediction of the model as far as ROC-Curve is concerned.
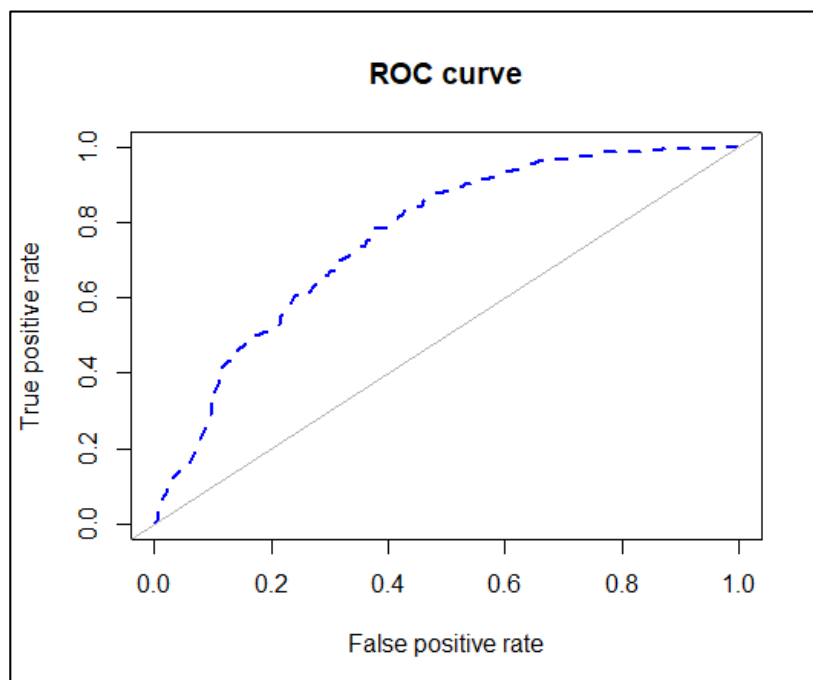

Fig 4.13. Receiver operating curve.

The ROC-Curve in Fig-4.13 shows that the model is accurate since the AUC is 0.76 which is greater than 0.5 hence the model prediction is accurate for the data analysis.

The logistic regression model was fitted by using R Statistical software and estimates were obtained by the maximum likelihood function method. The estimates of the fitted model are presented in the equation 3.

$$\text{logit}\left(\overset{\wedge}{\text{HPS}}\{^{\text{Poor=1}}_{\text{Not Poor=0}}\right) = -0.4761 + 0.3154\text{HHSize}_{\text{Medium.}} + 0.7691\text{HHSize}_{\text{Large.}} - 0.1321\text{HHEDU}_{\text{Secondary}}$$

$$-1.6722\text{HHEDU}_{\text{Diploma}} - 2.5009\text{HHEDU}_{\text{University}} + 0.2798\text{HHMS}_{\text{Married}} + 0.9731\text{HHMS}_{\text{Divorced}}$$

$$+0.2217\ \text{HHMS}_{\text{Widdow/er}} + 0.442\text{HHMS}_{\text{Separated}} - 0.4136\text{HHEMP}_{\text{Self-empl.}} - 0.3427\text{HHEMP}_{\text{Employed.}}$$

$$+0.8857\text{HHPR}_{\text{Rural}} - 0.4761\text{HHSLIV}_{\text{Non-Agri.}} - 0.3307\text{HHAGE}_{\text{Old Aged}} - 0.231\text{HHAGE}_{\text{Senior Aged}}\cdots\cdots(3)$$

The coefficients from the fitted model were changed into odds ratio as summarized in the Table.2. The results include the odd ratios, 95% CI as well as Probability value, Pr (>|Z|).Table 2 presents the Multivariate logistic regression analysis which shows the odds ratios for each categorical variable and 95% confidence intervals. The household main source of livelihood income was significant in determining the households' acute poverty. Non-agriculture households have less likelihood of being in acute poverty by 31.2% (OR=0.698; 95%CI: 0.50-0.98) compared to agriculture households as shown in Table 2.

The place of residence of the household was also found to have a significant effect on determining the households' acute poverty condition in Tanzania. The rural households have two times more odds of the bind in acute poverty as compare to urban households (OR=2.4247, 95%CI: 1.95-3.01). This implies that the households in the rural area are more likely in acute poverty compared to the urban household in Tanzania.

The results in Table 2 show that the categories of age which are (<36 years old), (36-60 years old) and (60+ years old). The age of the head of household was found to be of significance in determining the acute poverty in Tanzania.

The household with the head aged in age group between 36-60 years was found less likely of being in acute poverty comparing to head of household aged less than 36 years by 29.3% (OR=0.7184, 95%CI: 0.59-0.88).

Table 2: Multiple logistics regression model outputs.

Variables categories	Odd Ratios	(95% C.I)	Pr.(>|Z|)
(Intercept)			0.05336.
HHSLIV Agri. (Reference.)	1		
HHSLIV Non Agri.	0.698	0.50-0.98	0.03649 *
HHPR-Urban (Reference.)	1		
HHPR-Rural	2.4247	1.95-3.01	7.87e-16 ***
HHAGE-Young (<36 Years)-Ref	1		
HHAGE-Old (36-60 Years)	0.7184	0.59-0.88	0.00110 **
HHAGE-Senior (60+ Years)	0.7939	0.61-1.04	0.9079.
HHEMP-Unemployed (Ref.)	1		
HHEMP-Self Employed	0.6613	0.47-0.94	0.02166 *
HHEMP-Employed	0.7099	0.50-1.01	0.056459
HHMS-Never Married (Ref.)	1		
HHMS-Married	1.3229	0.89-2.00	0.17537.
HHMS-Divorced	2.2102	1.28-3.86	0.00487 **
HHMS-Widow(er)	1.2482	0.78-2.01	0.35577
HHMS-Separated	1.5558	0.95-2.57	0.08064.
HHSize-Small(<5 Members) -Ref.	1		
HHSize-Medium (5 Members)	1.3708	1.07-1.75	0.01216 *
HHSize-Large (>5 Members)	2.1579	1.78-2.62	6.52e-15 ***
HHEDU-Never attended (Ref.)	1		
HHEDU-Primary school.	0.8759	0.71-1.07	0.204768
HHEDU-Secondary school.	0.1878	0.13-0.26	< 2e-16 ***
HHEDU- Diploma	0.2217	0.01-0.44	0.019614 *
HHEDU-University graduates	0.442	0.01-0.26	3.51e-05 ***

Significance. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05.

The households which were headed by the heads with age above 60 years (retirement age in Tanzania), were found to be less likely of being in acute poverty (OR=0.79, 95%CI: 0.61-1.04) by 21.71% as compare to those headed by the head with age less than 36 years.

The employment status of the head of household is another variable which has the significant association with the acute poverty status in Tanzania. Table 2 presents that households' head, who is self-employed were found to be significant in determining the acute poverty status of the households. The households' head who is self-employed are less likely to be in acute poverty by 35% (OR=0.6613, 95%CI: 0.47-0.94; P=0.02166) as compared to those headed by unemployed heads. This implies that the households with heads who are self-employed minimize the chance of being poor by with comparison to those with unemployed heads. The households' heads who are employed less likely to be in acute poverty by 29.1%, (OR=0.7099, 95%CI: 0.50-1.01), compared to those with unemployed household's heads.

Marital status of the head of household also was another variable which has explained the households' acute poverty condition in Tanzania. Table2 presents results that the households' head who is married are more likely to be in acute poverty than those never married, by 32.3% (OR=1.3229, 95%CI: 0.89-2.00) this implies that for the household being married has higher chance to fall under acute poverty as compared to those with the heads never married. The case of the households' head divorced were also found to be significant in determining acute poverty since the household's head who is divorced has two times folds the likelihood (OR=2.2102, 95%CI:1.28-3.86; P=0.00487) of the particular household being under acute poverty as compared to those with the

head never married. The head with the marital status widow/er was found to be more likely in acute poverty by 24.8% (OR=1.2482, 95%CI: 0.78-2.01) as compared to those with the head never married. On the other hand the household with the head whose marital status is separated to be more likely in acute poverty by 55.6% (OR=1.5558, 95%CI: 0.95-2.57) than those who never married, this implies that the households with heads who rein separation marital status have a higher chance of falling under acute poverty as compared to those with the heads who never married. The size of the household was another variable found having the strong association with the acute poverty condition of the household in Tanzania. The results in Table 2 presents that, the households were in a category of medium size (5 Members only) is more likely to be in acute poverty by 37.1% (OR=1.3708, 95%CI: 1.07-1.75; P-value=0.01216) compare to those households with less than 5 members. The household being of large size (>5 Members) was also found to be significant in determining the acute poverty condition that is the household of large size has two times more likelihood (OR=2.1579, 95%CI: 1.78-2.62; P<0.0000) of being in cute poverty as compared to those of small size (<5 Members). This implies that the households of large size (>5 members) have a higher chance of more than twice than that of small size (<5 members) households in Tanzania.

The highest level of education attained by the head of household was also found to be a significant determinant of the households' acute poverty status in Tanzania. Table 2 presents the results on education levels attained by the head of household that household education levels of secondary, diploma and university graduate were found to be significant with P-values<0.05. The households with the head attained at primary school as their highest level were found to have less likelihood of being in acute by 12.4% (OR=0.8759, 95%CI: 0.71-1.07), compared to those with heads never attend school. The households with head attained at most secondary education level were found to be less likely in acute poverty by 91.2% (OR=0.1878, 95%CI: 0.13-0.26; P<0.0000) as compared to those headed by heads who never attended school. The households with the head who is a diploma holder were found to be less likely in acute poverty by 77.8% (OR=0.2217, 95%CI: 0.01-0.44) as compared to those with the head who never attended school. However for the households with the head attained at least university graduate level is less likely to be in acute poverty by 55.8% (OR=0.44, 95%CI: 0.01-0.26; P<0.0000) than those with the heads who never attended school, this implies that the more households' head attaining the higher education level the less the chance of those household to be exposed in acute poverty in Tanzania.

5. Conclusion

The poverty condition among the households are determined by different socio-economic and demographic factors, there is significant association between household head's socio-economic and demographic characteristics such as education level which means highest level attained by the household head, marital status of the head, employment status and age of the household head are found to be significant in determining the household acute poverty in Tanzania. The more the higher the level of education attained by the head of the household the lesser the probability of the household being in acute poverty in Tanzania. The households' head reached a graduate level in Tanzania was found to have the least chance of being in acute poverty. The households' head either employed or self-employed has less risk of being in acute poverty. In other side, the households' head in old and senior aged categories age groups (36-59) years and (60+) years old respectively have less risk of being in acute poverty. The marital status also has a significant effect on the determination of acute poverty since for the status of the head being divorced or separated are more likely to be in acute poverty. The general characteristics of the household such as household's place of residence, Main source of livelihood income and the size of the household itself were also found of significance in determining the household's acute poverty in Tanzania. The size of the household being large above (4.9 people national average household size in Tanzania) is more likely to be in acute poverty. The place of residence of the household being in rural also has a higher probability of falling under acute poverty as compared to urban households in Tanzania. On another hand, the households who rely on the non-agriculture source of income as the main source of their livelihood are less likely to be in acute poverty in Tanzania.

6. References

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